Additionally, Applicant has Amended the Specification to correct typographical and formatical errors and contends no new matter has been added to the Specification or Claims or the current Application.

35 U.S.C. § 103 (a) – Mirkovich (AS) in view of Froberg et al. (U.S. Pat. No. 3,607,210)

Examiner rejected Claims 1 and 3-6 under 35 U.S.C. § 103(a) as being unpatentable over Mirkovich (AS) in view of U.S. Pat. No. 3,607,210.

Mirkovich (AS)

Examiner states that Mirkovich discloses the process of substituting diopside, $CaMg(SiO_3)_2$ for some materials used in the production of glass (page 1) which provides for the reduction of the heat requirement (page 5)" and that "Mirkovich also explains that the melting point of diopside is lower than the melting points of the ingredients that diopside would partially replace (silica and carbonates, page 6) and that typical glass fiber batches would include boron oxide (page 5).

Applicant contends that although Mirkovich substitutes diopside for some of the materials used in the production of glass, he does not expand his work to other calcium magnesium silicates which react differently from diopside. The higher the amount of synthetic silicate (i.e. $Ca_xMg_ySiO_z$) in a glass batch as a weight percent, the faster the calcium magnesium silicate melts. Mirkovich does not disclose or teach this and no one has made the synthetic silicate taught by Applicant between the time Mirkovich published and Applicant filed the present application.

Additionally, in order to be able to formulate more silicate into a batch, a higher SiO_2 content in the silicate is needed than that which is found in diopside. Applicant's material has a higher SiO_2 content than the diopside disclosed by Mirkovich. Diopside has a chemical formula $Ca_xMg_ySiO_z$ wherein Z equals $2x$ or $2y$. Applicant discloses a $Ca_xMg_ySiO_z$ in which Z is greater than $2x$ or $2y$ (page 4, lines 7-11) and has a higher SiO_2 content than diopside and further reduces volatiles that

would be given off. This is not obvious from Mirkovich's or Froberg et al. teachings as no one has realized or used this technology in the art of glassmaking even though Mirkovich disclosed his findings with respect to diopside, almost thirty years ago.

Applicant has also Amended Claim 1 to include a potassium, sodium or aluminum as part of the composition as disclosed in the Specification on page 4 of the application.

U.S. Pat. No. 3,607,210 (Froberg et al.)

Examiner states that "Froberg et al. is relied on for the disclosure that molten glass gives off volatiles such as lead and boron alone or in the form of compounds and mixtures thereof (col. 1, line 40)" and that "one of ordinary skill in the art would understand that the substitution of diopside for materials used in the production of glass disclosed by Mirkovich would inherently reduce the production of volatiles because the heat requirements can be reduced since the melting point of diopside is lower as compared with silica and carbonates."

Applicant agrees that it is known that molten glass gives off volatiles. However, Froberg et al. teaches a modification to the forehearth of a furnace for protecting the upper or crown regions of a forehearth from the deleterious volatiles given off by molten glass (col. 4, lines 42-43). Applicant is synthesizing a $Ca_xMg_ySiO_z$ that when used reduces the amount of volatiles given off and therefore, no modification to the furnace is required.

Mirkovich (AS) in view of U.S. Pat. No. 3,607,210 (Froberg et al.)

Mirkovich substitutes naturally occurring mineral, diopside for stoichiometric quantities of $CaCO_3$, $MgCO_3$ and SiO_2 (page 1, 2nd para.). Applicant is producing a customized calcium magnesium silicate that also has potassium, sodium or aluminum associated with the compound. Froberg et al. teach a modification to the forehearth of a furnace so that the deleterious volatiles will not deteriorate the upper or crown region of the furnace. Using Applicants invention, no

modification of the forehearth would be necessary. It would not be obvious to synthesize the calcium magnesium silicate taught by the applicant based on the combination of Mirkovich and Froberg et al. as Froberg et al is an alternative to controlling the volatiles during a molten glass making process not reducing or eliminating volatiles that occur.

Mirkovich's teachings have been in the public domain for almost thirty years and no one has thought to modify the calcium magnesium silicates that are used in glass making to specifically make Applicants material. Therefore, it would not be obvious for one of ordinary skill in the art of glass making to do so.

35 U.S.C. § 103 (a) – Tomaino et al. (U.S. Pat. No. 6,211,103) in view of Froberg et al. (U.S. Pat. No. 3,607,210)

As noted by Examiner, the applied reference has a common inventor with the instant application. Examiner states that this rejection under 35 U.S.C. 103(a) might be overcome by filing an oath or declaration under 37 CFR 1.130, together with a terminal disclaimer in accordance with 37 CFR 1.321(c).

Applicant has included a Declaration stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c).

Applicant Amended Claim 1 to include that "z is a value which balances the empirical formula" support for which is found on page 4 lines 8-9. Additionally, Applicant Amended Claim 1 to include potassium, sodium, and aluminum values that "independently range from about 0.1 to about 0.6." Support for this can be found at page 4, line 8.

In view of the Amendment to Claim 1 and the Terminal Disclaimer, and in view of the foregoing arguments, Applicant respectfully requests removal of the 103(a) rejection. Support for

the Amendment to Claim 1

CONCLUSION

As all rejections are overcome, all claims are believed to be in condition for allowance. An early notice to that effect would be appreciated. Should Examiner not agree with Applicant's position, then a personal or telephonic interview is respectfully requested to discuss any remaining issues and expedite the eventual allowance of the application.

A two (2) month extension fee is believed due for the filing of this amendment. Should any other fees be required, however, please charge such fees to Minerals Technologies Inc. Deposit Account No. 13-3639.

Respectfully submitted,

Date 2/28/03

Michael J. Herman
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Agent for Applicant

Version With Markings Showing Changes Made

In the Specification:

Page 2, paragraph under "FIELD OF INVENTION"

The present invention relates to glass production. In particular it relates to [the] a composition of [the] a glass batch refined during the glass production operations.

Replace on page 2, paragraph under "BACKGROUND"

Glass production typically occurs through the production of a glass batch, which is melted and refined before the final glass production operations are performed. Refining is the heating step which, among other purposes, results in a mixed composition of reacted components and emission of gases of volatilized materials. Among the components admixed to form the glass batch composition are melting or refining aids which have value in the mixing and reaction operation in forming the glass composition, although may not add value to the glass composition itself. For example, boron is used as a melting aid in many operations. Another material is lead, which is a component of may crystal type glasses. Because of the high temperatures used in the melting and refining operations much of these components can be lost due to volatilization. Such loss [represent] requires use of an excess amount of volatile material and results in unwanted emissions and costs. Accordingly, there is a need for a method of producing glass batches with reduced volatilization.

Replace on page 3, paragraph under "SUMMARY"

The present invention has an objective of providing a method for the production of a glass composition with reduced loss of volatiles. Another objective is to provide a glass composition with increased homogeneity and purity. These and other objectives are achieved by a method for preparing a volatile-containing glass composition comprising forming a batch of glass-forming

components by mixing a volatile component source, a silicate component, and other glass-forming components. The batch of glass-forming components is melted and refined to obtain a glass composition. The refining produces a glass composition with greater homogeneity and purity. Also, less volatiles are evolved during glass operations than a glass composition having equivalent composition produced without using the silicate component of the present invention.

Replace on page 3, first paragraph under "DESCRIPTION OF PREFERRED EMBODIMENTS"

One embodiment of the present invention is a method for preparing a glass composition in which a batch of glass-forming components is formed by admixing a volatile component source, a silicate compound, and other glass-forming components. This glass forming composition is then melted and refined in a furnace. The resultant glass composition has a reduced variability of oxides distribution measured at the feed end of said furnace or a reduced loss of the volatile component than a glass composition having an equivalent composition produced without using the silicate compound of the present invention.

Replace first paragraph on page 4 with:

The volatile component is preferably selected from the group consisting of boron and heavy metals. Heavy metals include, for example, lead, selenium, and cobalt. Other heavy metals can be used, depending upon the glass maker's particular formulation.

Replace first full paragraph on page 5 with:

When the method of the present invention is used, the produced glass composition has a reduced variability of oxides distribution measured at the feed end of said furnace and/or a reduced loss of said volatile component than a glass composition having an equivalent composition produced without using said silicate compound of the present invention. The variability of oxide distribution obtained is favorably reduced using the present invention by at least about ten percent, more

preferably fifteen percent.

Replace the second full paragraph on page 5 with:

The volatile mass loss is favorably reduced by at least about five percent by mass, more preferably ten percent by mass. In the embodiment in which [h] boron is the volatile, the reduction of the loss of boron through volatilization is at least about ten percent by weight.

In the Claims:

1. (First Amendment) A method for preparing a glass composition, said method comprising forming a batch of glass-forming components by admixing a volatile component source containing a volatile selected from the group consisting of boron and heavy metals; a silicate compound of the formula $K_uNa_vAl_wCa_xMgySiO_z$, wherein K is potassium, Na is sodium, Al is aluminum, Ca is calcium, Mg is magnesium, Si is silica, and O is oxygen and u, v and w, independently range from about [0] 0.1 to about 0.5; x and y independently range from about 0.1 to about 0.6; z is a value which balances the empirical formula; and other glass-forming components; melting and refining the batch of glass forming components in a furnace the resultant melt to obtain a glass composition; wherein said glass composition has a reduced variability of oxides distribution measured at the fee end of said furnace or a reduces loss of said volatile component than a glass composition having an equivalent composition produced without using said silicate compound.